



Fig. 7(a)

Point	x-coordinate	y-coordinate
1	1	1
2	10	4
3	6	7
K	7	4

8. Write short notes on the following : **20**

- Perspective projections
- 3-D rotation
- Ordinary vs. homogeneous coordinates
- 16-point form.

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B. Tech. EXAMINATION, May 2017

(Eighth Semester)

(Old Scheme) (Re-appear Only)

(ME)

ME-402

COMPUTER AIDED DESIGN

Time : 3 Hours]

[Maximum Marks : 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. All questions carry equal marks.

- Some design applications would be better with CAD than others. What characterizes an application as a good candidate for CAD ? **10**

- (b) Enlist the importance of parametric equations coordinate system. **10**
2. (a) Discuss the rigid body transformation with mathematical elements. Are pure rotation and reflections solid body transformations ? **10**
- (b) A point P(2.5, 3.5, 5) is rotated by $+15^\circ$ in x - y plane and -25° in y - z plane. Find the final position of P. **10**
3. (a) What do you understand by Blending functions ? Discuss. **10**
- (b) Use the parametric representation given as $x = a \cosh \theta$, $y = b \sinh \theta$, to generate eight point on the hyperbolic segment in the first quadrant with $a = 2.1$, $b = 0.9$ for $4 \leq x \leq 8$. Rotate the hyperbola segment through vortex to 17° clockwise and represent the eight points. **10**
4. (a) What do you understand by Cubic Splines ? Discuss with mathematical elements involved with it. **10**

- (b) Find the osculating, tangent and normal planes for $x(t) = 3t$, $y(t) = 3t^2$, $z(t) = 2t^3$. Show these planes using plots for $-1 \leq t \leq 1$. **10**
5. Write a detailed note on B-spline surface using mathematical elements. **20**
6. What do you understand by Constructive Solid Geometry (CSG) ? Discuss. **20**
7. (a) What do you understand by Finite Element Method (FEM), discuss. In which conditions it is among the strongest tool. **5**
- (b) A point K is located inside the triangle as shown in Fig. 7(a). Assuming a linear distribution, determine the temperature at K. Coordinates of various points are given in the following table : **15**